

FOR IMMEDIATE RELEASE

**Hitachi and Toray are Commissioned by NEDO  
to Implement the Demonstration Project for an Energy Saving  
Seawater RO System in the actual scale in Saudi Arabia**

*Applying Japan's advanced technologies  
to save energy by approx. 20% and reduce construction cost*

**Tokyo, May 14, 2018** --- Hitachi, Ltd. (TSE: 6501, "Hitachi") and Toray Industries, Inc. (TSE: 3402, "Toray") today announced that they have been commissioned to implement the "Demonstration Project for an Energy Saving Seawater Reverse Osmosis(RO) System in the actual scale in the Kingdom of Saudi Arabia" within the framework of "International Project for Increasing the Efficient Use of Energy and System Demonstration Project" by the New Energy and Industrial Technology Development Organization ("NEDO"). The companies signed the commission contract with NEDO today. Under the contract, Hitachi and Toray will work together with Saline Water Conversion Corporation ("SWCC"), a Saudi Government owned seawater desalination company, in designing, constructing, and operating facilities for demonstrating an energy saving seawater RO system in the city of Ummluji, Saudi Arabia, and testing the performance of the system and studying the business model to put the system to practical use, aiming to expand the operation in the country and to its neighboring countries. The period for the demonstration project is scheduled to be approximately five years from April 2018 to March 2023.

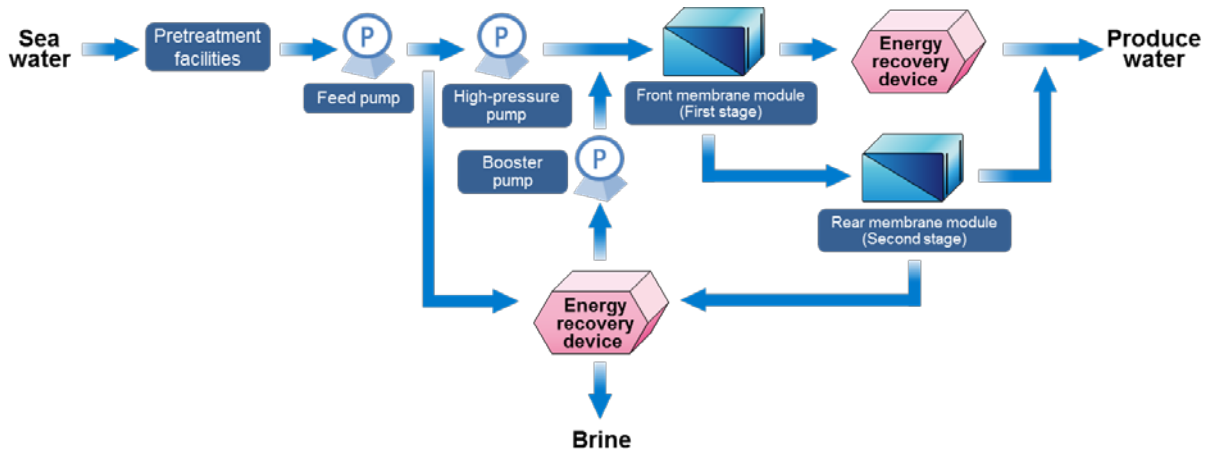
Saudi Arabia faces a shortage of water resources because the majority of its national land is dry, where rainfall is less than 100 mm per year. Accordingly, the country relies on seawater desalination for most of daily water needs. While the amount of freshwater produced in the country is among the largest in the world, a great amount of energy is consumed for desalinating seawater, which is a problem. In addition, while many seawater desalination plants need to be replaced because they are aging, demand for water is expected to continue rising due to the progress in industrialization under the Saudi Arabia's Vision 2030<sup>\*1</sup>, a long-term policy guidance, as well as the rising population, and construction and replacement of large-scale seawater desalination plants are being planned for the country. Against this background, SWCC recognized Japan's energy-saving technologies and decided to implement the demonstration project in Saudi Arabia with cooperation from government-affiliated organizations of Japan.

In this demonstration project, facilities for real-scale demonstration of an energy saving seawater RO System with a water production capacity of 10,000m<sup>3</sup>/ day<sup>\*2</sup> will be constructed in Ummluji, a city on the Red Sea coast. A low pressure multi-stage high recovery<sup>\*3</sup> seawater RO system developed by Hitachi and low-pressure seawater RO membranes developed by Toray will be used for the facilities based on the outcome of the Mega-ton Water System, which was established during FY2009 to FY2013 under the Funding Program for World-Leading Innovative R&D on Science and Technology (“FIRST Program” <sup>\*4</sup>), an R&D program of the Cabinet Office. The low pressure multi-stage high recovery seawater RO system features RO membrane vessels (tubular pressure vessels) installed in multiple stages, with which it controls the flow rate and pressure of the feed-water and thereby equalizes the volume of permeated water. It thus maximizes the performance of the RO membranes, ensuring high efficiency. At the same time, energy recovery device is applied for this system to reduce the energy consumed for driving the pump. In addition, the low-pressure seawater RO membranes ensure a high salt removal rate even with low-pressure operation. By applying these technologies, Hitachi and Toray aim to reduce energy consumption by around 20%<sup>\*5</sup> compared to conventional seawater desalination plants applying RO membranes. The companies also aim to reduce the construction cost<sup>\*6</sup> by reducing the capacity of the pretreatment facilities, which will be enabled by lowering the seawater intake.

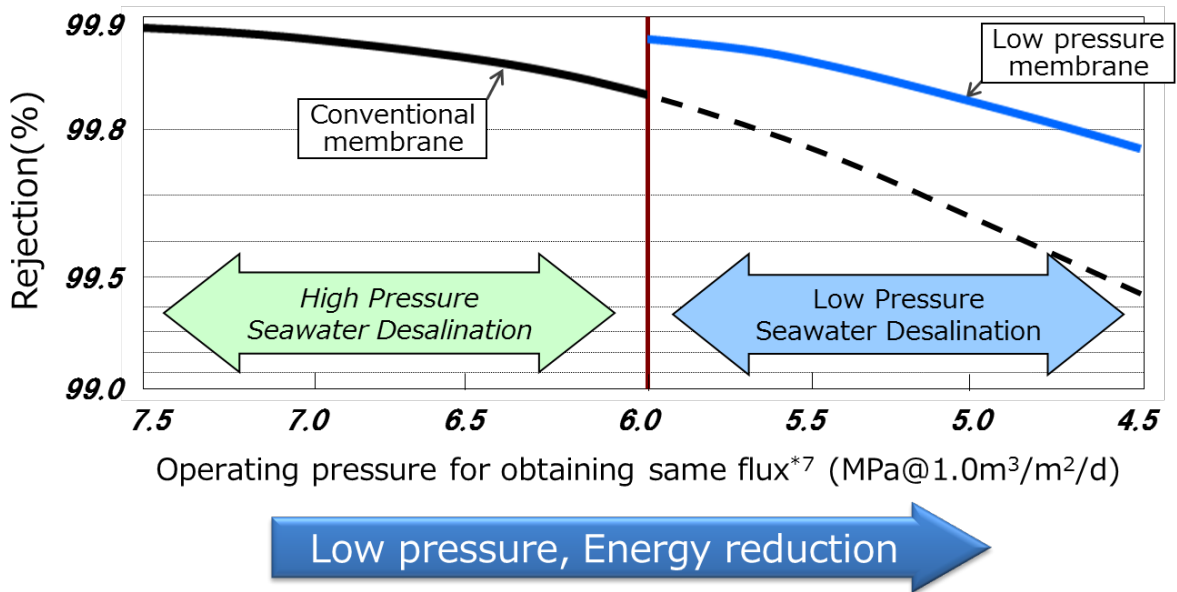
Since December 2016, Hitachi and Toray have been conducting a pilot test using a small-scale plant (water production capacity: 500 m<sup>3</sup>/day) at a research site of SWCC in Al-Jubail, a city located on the coast of the Arabian Gulf.

Hitachi and Toray will combine the strengths of both companies- Hitachi's water treatment engineering capabilities and Toray's water treatment membrane technologies- working together in the testing and implementation of the energy saving seawater RO system, in order to contribute to resolving the problem of water shortages in Saudi Arabia and other Middle Eastern countries.

**Flow of the low pressure multi-stage high recovery seawater RO system**



**Outline of the low-pressure seawater RO membranes**



**Notes:**

- \*1 Saudi Arabia’s Vision 2030: A national growth strategy of Saudi Arabia toward 2030, which was announced by its government in April 2016. Activities under the vision include economic reforms aimed at achieving sustainable development by breaking dependence on oil
- \*2 Water production capacity of 10,000m³/day: Equivalent to the amount of water that is supplied to approx. 25,000 people
- \*3 Recovery: Proportion of production water volume to seawater supply
- \*4 Funding Program for World-Leading Innovative R&D on Science and Technology (“FIRST Program”): A research support program that was established by the Council for Science and Technology Policy, Cabinet Office to promote cutting-edge research, aiming for the best in the world
- \*5, \*6 Values estimated by Hitachi and Toray, respectively, by comparing between a seawater desalination plant with a capacity of 1,000,000m³/ day with seawater salt concentration at 3.5% and a conventional one
- \*7 Flux: Flow volume per unit area per unit time (m³/m²/day)

**About Hitachi, Ltd.**

Hitachi, Ltd. (TSE: 6501), headquartered in Tokyo, Japan, delivers innovations that answer society's challenges, combining its operational technology, information technology, and products/systems. The company's consolidated revenues for fiscal 2017 (ended March 31, 2018) totaled 9,368.6 billion yen (\$88.4 billion). The Hitachi Group is an innovation partner for the IoT era, and it has approximately 307,000 employees worldwide. Through collaborative creation with customers, Hitachi is deploying Social Innovation Business using digital technologies in a broad range of sectors, including Power/Energy, Industry/Distribution/Water, Urban Development, and Finance/Social Infrastructure/Healthcare. For more information on Hitachi, please visit the company's website at <http://www.hitachi.com>.

**About Toray Industries, Inc.**

Toray Industries, Inc., founded in 1926, is an integrated chemical industry group developing its businesses in 26 countries and regions worldwide. Its consolidated revenues for fiscal 2017 (ended March 31, 2018) totaled 2,204.9 billion yen (\$20.8 billion). In addition to the fibers & textiles created at the time of its establishment, Toray has gone on to create cutting-edge, high value-added products including films, fine chemicals, plastic resins, electronics & information-related products, as well as carbon fiber composite materials, pharmaceutical and medical products, and products for the water treatment and environmental fields. For more information on Toray, please visit the company's website at <http://www.toray.com>

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Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.

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